Claims

1. A filter device having filter elements (2 through 6; 12 through 20; 22 through 25) made of ceramic material which are combined into at least one filter element group (1, 11, 21) in which the filter elements (2 through 6, 12 through 20; 22 through 25) lie side by side next to one another and can be flowed through in parallel,

wherein only some of the filter elements (2, 12, 22, 23) of each filter element group (1, 11, 21) have electrical terminals for connection with an electrical energy source, and at least that/those filter element(s) (2, 12, 22, 23) is/are made of electrically conductive ceramic material.

2. The filter device as defined in Claim 1, wherein the first filter element(s) (2, 12) is/are arranged at the center.

3. The filter device as defined in Claim 1, wherein the first filter elements (22, 23) are arranged in distributed fashion in the filter element group (21).

4. The filter device as defined in one of Claims 1 through 3, wherein the first filter element(s) (2, 12, 22, 23) is/are surrounded by the second filter elements (3 through 6; 13 through 20; 24, 25).

5. The filter device as defined in one of Claims 1 through 4, wherein the second filter elements (3 through 6; 13 through 20; 24, 25) are also made of electrically conductive ceramic material.

6. The filter device as defined in Claim 5, wherein the second filter elements (3 through 6; 13 through 20; 24, 25) resting against the first filter element(s) (2, 12, 22, 23) are in electrically conductive contact with the first filter element(s) (2, 12, 22, 23).

7. The filter device as defined in one of Claims 1 through 4, wherein the second filter elements (3, through 6; 13 through 20; 24, 25) are made of an electrically nonconductive ceramic material.

8. The filter device as defined in one of Claims 1 through 7, wherein the thermal conductivity of the second filter elements (3 through 6; 13 through 20; 24, 25) is greater than or less than that of the first filter element (1, 12) or first filter elements (22, 23).

9. The filter device as defined in one of Claims 1 through 8, wherein contact layers are arranged between the filter elements (2 through 6; 12 through 20; 22 through 25).

10. The filter device as defined in Claim 9, wherein the contact layers are made of the same ceramic base material as the filter elements (2 through 6; 12 through 20; 22 through 25).

11. The filter device as defined in Claim 9 or 10, wherein the contact layers are electrically conductive.

12. The filter device as defined in Claim 11, wherein the electrical conductivity of the contact layers is lower than that of the first filter elements (2, 12, 22, 23).

13. The filter device as defined in one of Claims 9 through 12, wherein the contact layers directly connect the filter elements (2 through 6; 12 through 20; 22 through 25).

14. The filter device as defined in one of Claims 9 through 12, wherein the contact layers are configured as separate layers with no material connection to the filter elements (2 through 6; 12 through 20; 22 through 25).

15. The filter device as defined in one of Claims 9 through 14, wherein the thermal conductivity of the contact layers is of the same order of magnitude as that of the first and/or second filter elements (2 through 6; 13 through 20; 22 through 25).

16. The filter device as defined in one of Claims 1 through 15, wherein the filter elements (2 through 6; 12 through 20; 22 through 25) comprise, next to and

alternating with one another, inflow conduits and outflow conduits that are separated by porous, filtrationally effective longitudinal walls, the inflow conduits being open on the inflow side and closed on the outflow side, and the outflow conduits being closed on the inflow side and open on the outflow side.

17. The filter device as defined in Claim 16, wherein the inflow and outflow conduits have a square cross section.

18. The filter device as defined in one of Claims 1 through 17, wherein the outer walls of the filter elements (2 through 6; 12 through 20; 22 through 25) are of particle-tight, in particular gas-tight, configuration.

19. The filter device as defined in one of Claims 1 through 18, wherein the outer walls of the filter elements (2 through 6; 12 through 20; 22 through 25) have a rectangular, square, oval, round, and/or shell-shaped cross section.

20. The filter device as defined in one of Claims 1 through 19, wherein the filter element group(s) (1, 11, 21) is/are surrounded by a housing having a gas inlet and a gas outlet.

21. The filter device as defined in Claim 20, wherein multiple filter element groups (1, 11, 21) are present and each filter element group (1, 11, 21) is surrounded by a separate housing.

22. The filter device as defined in one of Claims 1 through 21, wherein the filter elements (2 through 6; 12 through 20; 22 through 25) and if applicable the contact layers have substantially the same expansion coefficients over the operating temperature range.

23. A filter device having filter elements (2 through 6; 12 through 20; 22 through 25) made of ceramic material which are combined into at least one filter element group (1, 11, 21) in which the filter elements (2 through 6, 12 through 20; 22 through 25) lie side by side next to one another and can be flowed through in parallel, only some of the filter elements (2, 12, 22, 23) of each filter element group (1, 11, 21) have electrical terminals for connection with an electrical energy source, and at least that/those filter element(s) (2, 12, 22, 23) is/are made of electrically conductive ceramic material characterized in that the first filter element(s) (2, 12) is/are arranged at the center.

24. A filter device having filter elements (2 through 6; 12 through 20; 22 through 25) made of ceramic material which are combined into at least one filter element group (1, 11, 21) in which the filter elements (2 through 6, 12 through 20; 22 through 25) lie side by side next to one another and can be flowed through in parallel, only some of the filter elements (2, 12, 22, 23) of each filter element group (1, 11, 21) have electrical terminals for connection with an electrical energy source, and at least that/those filter element(s) (2, 12, 22, 23) is/are made of electrically conductive ceramic material characterized in that the first filter

elements (22, 23) are arranged in distributed fashion in the filter element group (21).

25. A filter device having filter elements (2 through 6; 12 through 20; 22 through 25) made of ceramic material which are combined into at least one filter element group (1, 11, 21) in which the filter elements (2 through 6, 12 through 20; 22 through 25) lie side by side next to one another and can be flowed through in parallel, only some of the filter elements (2, 12, 22, 23) of each filter element group (1, 11, 21) have electrical terminals for connection with an electrical energy source, and at least that/those filter element(s) (2, 12, 22, 23) is/are made of electrically conductive ceramic material characterized in that the electrical conductivity of the contact layers is lower than that of the first filter elements (2, 12, 22, 23).

26. A filter device having filter elements (2 through 6; 12 through 20; 22 through 25) made of ceramic material which are combined into at least one filter element group (1, 11, 21) in which the filter elements (2 through 6, 12 through 20; 22 through 25) lie side by side next to one another and can be flowed through in parallel, only some of the filter elements (2, 12, 22, 23) of each filter element group (1, 11, 21) have electrical terminals for connection with an electrical energy source, and at least that/those filter element(s) (2, 12, 22, 23) is/are made of electrically conductive ceramic material characterized in that the contact layers are configured as separate layers with no material connection to the filter elements (2 through 6; 12 through 20; 22 through 25).

27. A filter device having filter elements (2 through 6; 12 through 20; 22 through 25) made of ceramic material which are combined into at least one filter element group (1, 11, 21) in which the filter elements (2 through 6, 12 through 20; 22 through 25) lie side by side next to one another and can be flowed through in parallel, only some of the filter elements (2, 12, 22, 23) of each filter element group (1, 11, 21) have electrical terminals for connection with an electrical energy source, and at least that/those filter element(s) (2, 12, 22, 23) is/are made of electrically conductive ceramic material characterized in that the filter elements (2 through 6; 12 through 20; 22 through 25) comprise, next to and alternating with one another, inflow conduits and outflow conduits that are separated by porous, filtrationally effective longitudinal walls, the inflow conduits being open on the inflow side and closed on the outflow side, and the outflow conduits being closed on the inflow side and open on the outflow side.